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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,831	10/22/2001	Yoshinori Hayashi	215144US2	5402

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EXAMINER	
PHAM, HAI CHI	

ART UNIT	PAPER NUMBER
2861	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/982,831	Applicant(s) HAYASHI ET AL.	
	Examiner Hai C Pham	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-33 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,16-18,20,21 and 24-27 is/are rejected.

7)☒ Claim(s) 3-15,19,22,23 and 28-33 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,9-10/12,13
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

3. Claim 14 is objected to because of the following informalities:

- Line 7, "an joint" should read --a joint--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 20, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Acknowledged Prior Art (referred hereinafter as AAPA) in view of Takeyama (JP 4-277771).

AAPA discloses in Fig. 4 a conventional optical scanning device having a plurality of scanning optical systems arranged in a main scanning direction similar to the claimed optical scanning device where each of the scanning optical systems comprising a plurality of light sources emitting light beams, a light source driving circuit (inherent to any optical scanning device) modulating the emitted light beams separately, and a deflector causing the light beams to perform scanning.

However, AAPA fails to teach one of the scanning optical systems comprising a light source selection part selecting one of said light sources of the one of the scanning optical systems.

Takeyama discloses an image recording device comprising a plurality of light sources for recording wherein the optical writing is performed by selecting one of the light sources based on the difference between the main scan synchronizing signal and the recording start signal so as to reduce the longitudinal register deviation between the different scan lines.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of AAPA with the aforementioned teaching of Takeyama. The motivation for doing so would have been to prevent the longitudinal register deviation between the different scan lines as suggested by Takeyama.

6. Alternatively, claims 1, 20, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takano (JP 8-72308) in view of Takeyama.

Takano discloses an image forming device comprising a plurality of scanning optical systems arranged in a main scanning direction, the scanning optical systems each comprising a plurality of light sources emitting light beams (1a, 1c/1b, 1d), a light source driving circuit (inherent to any optical scanning device) modulating the emitted light beams separately, and a deflector (4a/4b) causing the light beams to perform scanning (Figs. 1, 3).

However, Takano fails to teach one of the scanning optical systems comprising a light source selection part selecting one of said light sources of the one of the scanning optical systems.

Takeyama discloses an image recording device comprising a plurality of light sources for recording wherein the optical writing is performed by selecting one of the light sources based on the difference between the main scan synchronizing signal and the recording start signal so as to reduce the longitudinal register deviation between the different scan lines.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Takano with the aforementioned teaching of Takeyama. The motivation for doing so would have been to prevent the longitudinal register deviation between the different scan lines as suggested by Takeyama.

7. Claims 2, 16-18, 21, 24-25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takano in view of Takeyama, as applied to claims 1, and further in view of De Loor (U.S. 5,654,817).

Takano, as modified by Takeyama, discloses all the basic limitations of the claimed invention except for the light source driving circuit comprises a function of correcting a modulation frequency for each of the light beams, a recording start time control part controlling a recording start time of image information of a first line of the first scanning area and generating a recording start time signal based on a scanning position deviation in a sub scanning direction between a scanning end position of the second scanning area and a corresponding scanning start position of the first scanning area.

De Loor discloses a divisional scanning device comprising a plurality of optical scanning devices provided in cascade along the main scan direction, and a means for correcting both in-scan and cross-scan deviations between the separate modules. De Loor further teaches the selection of one of the segments scanned by the plural modules as a master and the tuning of the pixel clock frequency of each of scanning beams to synchronize the different modules in order to compensate for the above-mentioned deviations. De Loor also teaches a detector for determining the time difference between first and second control pulse for scanning each segment (col. 3, lines 14-24), the first control pulse for enabling an exact phase relation between the starting point detection and the placement of the first scanned pixel while the second

control pulse tunes the pixel clock frequency of each of scanning beams to synchronize the different modules in order to compensate for the above-mentioned deviations (col. 8, line 65 to col. 9, line 16).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the modulation frequency correction and the scanning position control unit as taught by De Loor in the modified device of Takano. The motivation for doing so would have been to compensate for the in-scan and cross-scan deviations of the divisional scanning device.

Allowable Subject Matter

8. Claims 3-15, 19, 22-23, 28-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of the claimed invention, with respect to claims 3-15, 22-23, is the inclusion of the limitation, in the combination as currently claimed, that the first optical scanning device of the cascade optical scanning devices includes a light source selection part for generating a light source selection signal and for selecting the one of the light sources which one is used for recording image information of a first line of the first scanning area, which is not found taught or fairly suggested by the prior arts made of record, considered alone or in combination.

The primary reason for the indication of the allowability of the claimed invention, with respect to claims 19, 33, is the inclusion of the limitation, in the combination as currently claimed, that the scanning position control part of the divisional optical scanning devices turns a bending mirror of the first scanning optical system around an axis parallel to the main scanning direction, and which is not found taught or fairly suggested by the prior arts made of record, considered alone or in combination.

The primary reason for the indication of the allowability of the claimed invention, with respect to claims 28-32, is the inclusion of the limitation, in the combination as currently claimed, that the light source selection signal is generated based on a time difference between recording start times of the one and an adjacent one of the scanning optical systems and a scanning position deviation in a sub scanning direction between a scanning end position of a scanning area of the adjacent one of the scanning optical systems and a corresponding scanning start position of the scanning area of the one of the scanning optical systems, the scanning areas being adjacent to each other. The combined limitations are not found taught or fairly suggested by the prior arts made of record, considered alone or in combination.

Additional Prior Arts

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ohashi et al. (U.S. 5,107,280) discloses a divisional exposure apparatus having a plurality of optical scanning devices, each including a laser source and a polygon

mirror for scanning a segment of the main scan line, and being arranged to compensate for the traveling speed of the common photosensitive drum such that the segmented scanning lines are parallel to the axis of the drum and being connected.

Suda et al. (U.S. 5,877,885) discloses a scanning apparatus having a cascade scanning optical system in which the scanning lines formed by the scanning laser beams emitted by the pair of scanning optical systems are prevented from deviating from each others in either main scanning direction or sub-scanning direction.

Takano et al. (U.S. 5,903,378) discloses a scanning apparatus having a cascade scanning optical system provided with a measuring device for measuring a time interval, and a determining device for determining a time-delay interval, and an adjusting device for adjusting the time at which the first scanning line starts to be generated in accordance with the time-delay interval to compensate for abutting errors of the first and second scanning lines.

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin R. Fuller can be reached on (703) 308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432 for regular communications and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

HAI PHAM
PRIMARY EXAMINER

July 17, 2003